

## CHAPTER VI

# The Ten-in-One Ration

### ORIGIN

The possibility of packaging the Type B Field Ration<sup>1</sup> in units of ten, with a total weight of approximately 50 pounds, was suggested as early as 1941.<sup>2</sup> The suggestion was not acted upon at the time, however, and the project remained dormant until the spring of 1943, when it was suddenly re-animated and pushed rapidly to a successful conclusion. Two factors were chiefly responsible for the revival of the project at this time. One of these was the great success achieved by the British Composite Pack, or "Compo" Ration, during the North African campaign in the fall of 1942. This ration, packaged to feed 14 men for 1 day and containing nine different menus, was expected to provide the only subsistence in new operations for as long as 42 days.<sup>3</sup> Impressed by the success of the "Compo" Ration in this operation, the Research and Development Branch of the Office of The Quartermaster General undertook a careful and complete study of this ration in the spring of 1943.<sup>4</sup> The second factor which led to the revival of the 10-in-1 project at this time was the movement for the simplification of rations previously mentioned.<sup>5</sup> It will be recalled that the aim ultimately established as the result of a series of conferences was the development and standardization of two special rations (in addition to the Type A and Type B field rations) that should eventually replace all the special rations then being procured for the Army Ground Forces. The two rations envisaged were an individual combat ration and a small-group field ration, the latter to be composed of the components of the standard Type B Field Ration "with modifications to reduce bulk and weight."<sup>6</sup> The attempt to develop a satisfactory individual combat ration to replace those then in use was temporarily unsuccessful, as we have seen,<sup>7</sup> but the quest for a satisfactory small-group ration was crowned with almost immediate success.

<sup>1</sup> The Type B Field Ration is the same as the regular, or Type A Field Ration, except that the perishable foods of the latter are replaced in Type B by non-perishable foods.

<sup>2</sup> Sub. Res. Lab., "Research Report No. 74-41," Nov. 8, 1941.

<sup>3</sup> It was said that in North Africa some troops had lived on the ration for 120 days ("Comments on Report of Conference on North Africa," March 2, 1943, Military Intelligence Section, OQMG); cf. *supra*, p. 80, n. 13.

<sup>4</sup> Research and Development Branch (Doriot) to Operations Branch, Military Planning Div., March 16, 1943, "Lessons Derived from Operations at Casablanca and Oran." It is difficult to assess the influence of the British "Compo" Ration on the development of our own 10-in-1 Ration. That it had some influence is evidenced by the statement made in the OQMG that "this ration is based somewhat on the idea of the British 14-men (Compo Ration) only it is made to suit American taste" (Packaging Section, Research and Development Branch [Jahn] to Col. Doriot, May 6, 1943. It is worth noting, also, that at the time the 10-in-1 was being developed over here, suggestions for a 12-in-1 ration along similar lines emanated from the office of the Chief Quartermaster, European Theater of Operations, located in London. This office had apparently not been apprised of the work being done on the 10-in-1, and its suggestion was therefore an independent one, doubtless motivated by the success of the British "Compo" (Brig. Gen. J. L. Frink to Brig. Gen. R. M. Littlejohn, Chief Quartermaster, European Theater of Operations, July 27, 1943).

<sup>5</sup> *Supra*, pp. 105 ff.

<sup>6</sup> Lt. Col. J. D. Tanner, Asst. Ground Adj. Gen., to Commanding General, ASF, March 28, 1943, "Simplification of Rations for Active Field Operations."

<sup>7</sup> Cf. *supra*, pp. 93 ff.

The purpose of the new ration was "to serve as the principal ration for subsistence of troops in all areas in advance of the field kitchens but prior to engaging in actual combat; for troops isolated in small groups; and for highly mobile troops."<sup>8</sup> It was presumed that it would "take care of all the tactical situations not satisfied by Combat Rations, such as C and K, or Base Area Rations, such as A and B,"<sup>9</sup> and it was hoped that it would satisfactorily perform this function for as long as five or six weeks,<sup>10</sup> as had its prototype, the British "Compo" Ration. The general requirements for the accomplishment of the purpose that the ration was intended to serve were laid down early in 1943 in a conference between representatives of the Office of The Quartermaster General and the Army Ground Forces; they included packaging on a 10-in-1 basis with a maximum weight limitation of 40 pounds.<sup>11</sup> It was subsequently decided that distribution and the use of the ration by smaller tactical units might be materially aided "by packing the ration on a double 5 in 1 basis."<sup>12</sup> The desirability of a package that should "have enough flotation to avoid sinking in either salt or fresh water" was also mentioned, and for variety a minimum of three menus was suggested.<sup>13</sup> As finally determined and stated at the time of its adoption, the required military characteristics of the 10-in-1 Ration were as follows:

Minimum bulk and weight; adequate nutritional value and palatability; stable under broadest possible range of climatic conditions; shall provide variety in the menu; sufficient for ten men for one day under normal conditions; the complete ration to be broken down into two equal and identical units; packaged in sturdy containers of minimum bulk and weight, adequately proofed against water and moisture vapors and chemical agents in normal concentrations; and of suitable shape and size for transport by animal pack, man-carry or motor vehicle.<sup>14</sup>

### DEVELOPMENT OF THE RATION

In view of the desirability of haste indicated in reports from overseas and stressed by the Army Ground Forces,<sup>15</sup> the Research and Development Branch of the Office of The Quartermaster General, immediately upon the determination of the general requirements, undertook in collaboration with the Chicago Subsistence Research Laboratory to push the development of a 10-in-1 ration rapidly to a successful conclusion. It was estimated early in March that the job could be done in 30 to 45 days.<sup>16</sup> In pursuance of this program Mr.

<sup>8</sup> Sub-Committee on Rations to QMC Technical Committee, June 7, 1943.

<sup>9</sup> Col. G. F. Doriot to Col. D. C. Cordiner, Chief Quartermaster, Hdqrs., U. S. Army Forces in the Far East, June 24, 1943.

<sup>10</sup> Subsistence Section, Research and Development Branch, Military Planning Div., (Burgess) to Subsistence Branch, Storage and Distribution Div., July 1, 1943.

<sup>11</sup> Col. G. F. Doriot to The QMG, March 3, 1943; G. W. Burgess, "Report of Inspection of Quartermaster Activities at Chicago, Ill., March 10 to March 14, 1943" March 24, 1943.

<sup>12</sup> Burgess, "Report," March 24, 1943.

<sup>13</sup> Lt. Col. J. D. Tanner, Asst. Ground Adj. Gen., to Commanding General, ASF, March 28, 1943.

<sup>14</sup> Sub-Committee on Rations to QMC Technical Committee, June 7, 1943.

<sup>15</sup> Burgess, "Report," March 24, 1943.

<sup>16</sup> Col. G. F. Doriot to The QMC, March 3, 1943.

standardized, could be issued to troops on maneuvers and thereafter shipped to active theaters of operation.<sup>31</sup> On June 7, therefore, the Sub-Committee on Rations of the Quartermaster Corps Technical Committee in a report to the parent committee recommended that the new 10-in-1 Ration be adopted and standardized to replace the Mountain, Jungle, and 5-in-1 Rations.<sup>32</sup> On the following day the Quartermaster Corps Technical Committee adopted this report,<sup>33</sup> and on June 25 formal approval was given to the standardization of the new ration, the Mountain, Jungle, and 5-in-1 Rations, which were being replaced by the new 10-in-1, being classified "limited standard."<sup>34</sup>

As finally adopted and standardized, the 10-in-1 Ration followed that set of menus tentatively proposed in April that utilized units of the K Ration for the mid-day meals. Only a few minor changes in addition to those already mentioned had been made in the three menus of the April draft.<sup>35</sup> As already noted, two new menus had been added. The average caloric value of the five menus, however, was somewhat lower than that of the earlier set,<sup>36</sup> being only 3,377.<sup>37</sup> It was considered, however, to be "suitable for use in all climates from a nutritional point of view, and is sufficiently resistant to hot and cold weather to permit storage and distribution under all climatic conditions."<sup>38</sup> It was also said to conform with the original intention of developing a ration based on the Type B Field Ration "with modifications to reduce bulk and weight."<sup>39</sup> It was described in general terms as follows.

A small-group field ration, composed of components of the standard field ration type "B" (modified to reduce bulk and weight) packed in basic packages of 5 complete rations each, is practically ready for standardization. . . . The inner and outer packages are to be proof against water, vapor, moisture, and chemical agents. They are to be of such shape and dimensions as to be suitable for either animal-pack or man-carry, and sufficiently sturdy as to material and construction to withstand normal handling and transportation in motor vehicles, on pack animals or by man-carry.<sup>40</sup>

<sup>31</sup> Sub-Committee on Rations to QMC Technical Committee, June 7, 1943; Capt. R. J. Delacroix, Asst. Ground Adj. Gen., to Commanding General, ASF, June 15, 1943, 2nd ind. to memo Col. L. C. Webster to same, May 21, 1943.

<sup>32</sup> Sub-Committee on Rations to the QMC Technical Committee, June 7, 1943.

<sup>33</sup> "Minutes of the QMC Technical Committee, Meeting No. 12," June 8, 1943, p. 4.

<sup>34</sup> Brig. Gen. W. A. Wood, Jr., GSC, to The QMG, 4th ind. to report Sub-Committee on Rations to QMC Technical Committee, June 7, 1943, "Ration, Ten-in-One."

<sup>35</sup> Jam was substituted for Army Spread instead of for the dehydrated fruit powders, as originally intended.

<sup>36</sup> Cf. *supra*, p. 109.

<sup>37</sup> Computed from total caloric value for each menu as given in chart in files of Research and Development Branch, OQMG. This chart is not dated or otherwise identified, but the menus correspond in their food components with those submitted at the time of standardization, contained in report Sub-Committee on Rations to QMC Technical Committee, June 7, 1943, inclosure No. 1.

<sup>38</sup> Sub-Committee on Rations to QMC Technical Committee, June 7, 1943.

<sup>39</sup> Cf. *supra*, p. 108. In refutation of subsequent criticisms from within the Army to the effect that "we should work in the direction of producing a composite type ration more nearly the equivalent of the bulk type B Ration," the specialist in the OQMG most closely connected with the development of the new ration stated: "We feel that we have in very large measures [sic] done this because even casual observations of the menus indicate that almost without exception components of the breakfast and evening meals are items from the B Ration changed only somewhat in form. For instance, the bacon is canned, the cereals are pre-mixed with milk and sugar, and the beans are pre-cooked" (Subsistence Section, Research and Development Branch, Military Planning Div. [Burgess] to Subsistence Branch, Storage and Distribution Div., July 1, 1943).

<sup>40</sup> Col. G. F. Doriot to Chief, Conservation Branch, Production Div., Hdqrs., ASF, June 9, 1943. The menus will be described in greater detail in connection with the discussion of the preparation of specifications, *infra*, pp. 112 ff.

The packaging, as determined upon shortly thereafter, was described more specifically by the director of the Subsistence Research Laboratory.

The items in flexible packaging were placed in two wax dipped, arsenal type cartons, and the canned items were placed in two fiber cartons. The four cartons were then packed in a V 1 S or V 1 RS shipping case.<sup>41</sup>

The cases were capable of being floated in water, though it was not considered desirable to do so if it could be avoided.<sup>42</sup> The chief features that distinguished the new ration from the old 5-in-1 were the use of units of the K Ration for the noon meals, making possible individual distribution, and the overpacking of two 5-in-1 units in a single container.<sup>43</sup>

#### DRAFTING THE SPECIFICATIONS

The drafting of more or less permanent specifications for the new ration proceeded apace. Shortly after its standardization several changes were made to facilitate packaging and for other reasons, and a few miscellaneous items that had been proposed prior to the standardization meeting were added. Two 6-ounce cans of evaporated milk were substituted for the two 3-ounce cans of a milk and sugar preparation formerly included in the breakfasts of four menus. In the supper of Menu I two 20-ounce packages were substituted for the previous four 12-ounce packages of dehydrated baked beans, thus reducing the total amount from 48 to 40 ounces.<sup>44</sup> In order to bring up the caloric value of this menu two 20-ounce cans of a tapioca fruit dessert were substituted for 13 $\frac{3}{4}$  ounces of hard candy previously supplied for this meal. The grape beverage previously supplied with the supper in Menu I and the coffee that was previously the beverage for the supper of Menu V were switched. In the interest of variety and a better balance of nutritive values certain shifts were also made in the K units that constituted the noon meal in all menus.<sup>45</sup> The changes in the food components resulted in raising the average caloric value somewhat, to wit, from 3,377<sup>37</sup> to 3,421.<sup>46</sup>

Among the non-food items also certain changes and additions were made at this time. Soap and toilet tissue, the inclusion of which had been proposed prior to standardization, and which had actually appeared in the April version of the menus, were now again included.<sup>47</sup> The Halazone tablets

<sup>41</sup> Col. R. A. Isker to The QMG, June 15, 1943. For the V-type case cf. *supra*, p. 80, n. 10.

<sup>42</sup> Upon inquiry from the Infantry representative, information was furnished that the ration, as packaged, will float. However, representative of the Subsistence Branch, Storage and Distribution Division, Office of The Quartermaster General, advised that although the ration will float and the containers are proofed against moisture and chemical agents in normal concentrations, the ration should not be floated ashore unless absolutely necessary, as the action of salt from the sea water will severely damage the containers within a few weeks" ("Minutes of the QMC Technical Committee, Meeting No. 12," June 8, 1943, p. 4).

<sup>43</sup> Col. G. F. Doriot to Col. D. C. Cordner, Chief Quartermaster, Hdqrs., U. S. Army Forces in the Far East, June 24, 1943.

<sup>44</sup> This was to bring the amount of this item into conformity with the maximum amount that could probably be consumed with relish (information supplied by G. W. Burgess).

<sup>45</sup> Major R. R. Melson to Dr. F. C. Blanck, June 11, 1943.

<sup>46</sup> Cf. *supra*.

<sup>47</sup> Computed from total caloric values for each menu given in chart in files of Research and Development Branch, OQMG. This chart is undated and otherwise unidentified, but internal evidence indicates that it represents the ration as it stood at this time.

It will be recalled that the toilet tissue had been replaced by paper towels in the menus presented at the time of standardization. The soap now re-included in the ration was an "all purpose toilet soap which, according to laboratory and field tests, will give satisfactory performance for toilet use, shaving, manual laundering of clothes, and mess kit cleaning in any reasonable temperature of water ranging in hardness from zero to that equivalent to sea water" (OQMG, "Daily Activity Report," June 16, 1943 [Vol. XXIV, No. 14]).

Ration was released.<sup>52</sup> A few other changes, in addition to those already mentioned, had been made since the time of standardization. As the result of an improved filling process<sup>53</sup> the capacity of the cans in Menu I containing pork sausage had been increased from 32 to 34 ounces. Similarly in Menu III the capacity of the cans containing ham and eggs had been increased from 28 to 30 ounces and a like increase had been made in the capacity of the cans containing bacon and eggs in Menu V.<sup>54</sup> On the other hand, two 13-ounce cans had been substituted for four 10-ounce cans of dehydrated corned beef hash in Menu V, thus reducing the total amount of this component by 14 ounces.<sup>55</sup> In Menu II 20 ounces of fruit bars had been substituted for a like amount of prunes. Following is a detailed description of the food components (except salt) of each menu at the time of the issuance of the specification.<sup>56</sup>

### Menu I

#### BREAKFAST

| Product                            | No. of Units | Minimum Net Wt. of Units (in ounces) |
|------------------------------------|--------------|--------------------------------------|
| Cereal, Pre-mixed                  | 2            | 10                                   |
| Pork Sausage Meat, Canned          | 2            | 34                                   |
| Biscuits, C Square and Jam, Canned | 1            | 32                                   |
| Coffee Product, Soluble, Canned    | 2            | 11                                   |
| Milk, Evaporated                   | 2            | 6                                    |

#### DINNER

(Units or partial units of K Ration as follows)  
 Cheese, Canned,  
 2 Packages Biscuits (one package each of any two types),  
 1 Package Hard Candy,  
 1 Package Lemon Juice Powder, Synthetic,  
 0.8 oz. Sugar (four individually wrapped tablets or 0.8 oz. granulated in an approved carton),  
 1 Stick Chewing Gum,  
 1 Key, Can.

#### SUPPER

| Product                                    | No. of Units | Minimum Net Wt. of Units (in ounces) |
|--|--------------|--------------------------------------|
| Beans, Baked, Dehydrated                   | 2            | 20                                   |
| Tomatoes, Canned                           | 2            | 19                                   |
| Biscuits, C Square and Army Spread, Canned | 1            | 32                                   |
| Coffee Product, Soluble, Canned            | 2            | 3 <sup>3/4</sup>                     |
| Pineapple-Rice Pudding, Canned             | 2            | 1                                    |
|  |              | 20                                   |

### Menu II

#### BREAKFAST

| Product                            | No. of Units | Minimum Net Wt. of Units (in ounces) |
|------------------------------------|--------------|--------------------------------------|
| Cereal, Pre-mixed                  | 2            | 10                                   |
| Bacon, Sliced, Canned              | 2            | 24                                   |
| Biscuits, C Square and Jam, Canned | 1            | 32                                   |
| Coffee Product, Soluble, Canned    | 2            | 11                                   |
| Milk, Evaporated                   | 2            | 6                                    |

<sup>52</sup> C.Q.D. No. 140. Up to the time of writing this was the only specification that had been issued for this ration.

<sup>53</sup> Information supplied by G. W. Burgess.

<sup>54</sup> These changes, being the result of an improved filling process, increased the caloric content of the ration without increasing the size of the containers.

<sup>55</sup> Because of lack of previous experience with this product it had been difficult to determine the optimum amount; the reduction was due also to an unwillingness to concentrate too heavily on an entirely new product (information supplied by G. W. Burgess).

<sup>56</sup> Since the components are listed only by menus, and not separated according to meals in the specifications, C.Q.D. No. 140, the chart previously referred to (*supra*, p. 110, n. 42), which shows the ration as it had been revised shortly after standardization, and which also shows the arrangement by meals, has been used in order to show in this table the separate meals. The components and amounts in each case, however, are those which appear in C.Q.D. No. 140.

#### DINNER

(Units or partial units of K Ration as follows)  
 Cheese, Canned,  
 2 Packages Biscuits (one package each of any two types),  
 1 Package Malted Milk-Dextrose Tablets,  
 1 Package Lemon Juice Powder, Synthetic,  
 0.8 oz. Sugar (four individually wrapped tablets or 0.8 oz. granulated in an approved carton),  
 1 Stick Chewing Gum,  
 1 Key, Can.

#### SUPPER

| Product                                    | No. of Units | Minimum Net Wt. of Units (in ounces) |
|--|--------------|--------------------------------------|
| Stew, English Style, Canned                | 2            | 30                                   |
| Beans, Snap, Canned                        | 2            | 19                                   |
| Biscuits, C Square and Army Spread, Canned | 1            | 32                                   |
| Fruit Bars                                 | 10           | 3 <sup>3/4</sup>                     |
| Coffee Product, Soluble, Canned            | 2            | 2                                    |
|  |              | 1                                    |

### Menu III

#### BREAKFAST

| Product                            | No. of Units | Minimum Net Wt. of Units (in ounces) |
|------------------------------------|--------------|--------------------------------------|
| Cereal, Pre-mixed                  | 2            | 10                                   |
| Ham and Eggs, Canned               | 2            | 30                                   |
| Biscuits, C Square and Jam, Canned | 1            | 32                                   |
| Coffee Product, Soluble, Canned    | 2            | 11                                   |
| Milk, Evaporated                   | 2            | 6                                    |

#### DINNER

(Units or partial units of K Ration as follows)  
 Meat, Canned,  
 2 Packages Biscuits (one package each of any two types),  
 1 2-oz. Bar U.S. Field Ration D,  
 1 Package Coffee,  
 0.8 oz. Sugar (four individually wrapped tablets or 0.8 oz. granulated in an approved carton),  
 1 Stick Chewing Gum,  
 1 Key, Can.

#### SUPPER

| Product                                    | No. of Units | Minimum Net Wt. of Units (in ounces) |
|--|--------------|--------------------------------------|
| Beef, Corned, Canned                       | 4            | 12                                   |
| Peas, Canned                               | 2            | 20                                   |
| Biscuits, C Square and Army Spread, Canned | 1            | 32                                   |
| Fruit Bar                                  | 2            | 3 <sup>3/4</sup>                     |
| Orange Powder, Synthetic                   | 10           | 2                                    |
| Sugar                                      | 19           | 7 <sup>1/2</sup>                     |
|  | 2            | 8                                    |

<sup>1</sup> Grams.

### Menu IV

#### BREAKFAST

| Product                            | No. of Units | Minimum Net Wt. of Units (in ounces) |
|------------------------------------|--------------|--------------------------------------|
| Cereal, Pre-mixed                  | 2            | 10                                   |
| Bacon, Sliced, Canned              | 2            | 24                                   |
| Biscuits, C Square and Jam, Canned | 1            | 32                                   |
| Coffee Product, Soluble, Canned    | 2            | 11                                   |
| Milk, Evaporated                   | 2            | 6                                    |

#### DINNER

(Units or partial units of K Ration as follows)  
 Egg Product, Canned,  
 2 Packages Biscuits (one package each of any two types),  
 1 Fruit Bar,  
 1 Package Coffee,  
 0.8 oz. Sugar (four individually wrapped tablets or 0.8 oz. granulated in an approved carton),  
 1 Stick Chewing Gum,  
 1 Key, Can.

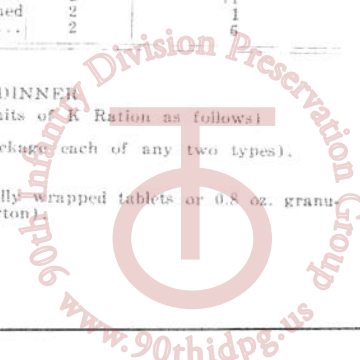


Table No. 11 shows some of the nutritive values of the various menus and the average for all five as calculated

about this time, together with the quantities in each case recommended by the National Research Council.

Table 11

|            | 10-in-1 Ration |         |          |         |        | Average | N. R. C. Recommendations |           |
|------------|----------------|---------|----------|---------|--------|---------|--------------------------|-----------|
|            | Menu I         | Menu II | Menu III | Menu IV | Menu V |         | Mod. Act.                | Very Act. |
| Calories   | 3563.4         | 4056.1  | 3690.3   | 3949.0  | 3894.9 | 3831.8  |                          |           |
| Protein    | 81.42          | 98.73   | 121.7    | 100.7   | 113.2  | 105.15  | Gms.,                    | 3000      |
| Fat        | 147.5          | 200.5   | 145.4    | 185.9   | 164.6  | 168.78  | "                        | 70        |
| Thiamin    | 1.03           | 1.03    | 1.99     | 1.14    | 1.55   | 1.48    | Mgs.,                    | 1.8       |
| Riboflavin | 2.06           | 2.57    | 2.53     | 1.77    | 3.09   | 2.44    | "                        | 2.7       |
| Niacin     | 19.0           | 11.7    | 19.4     | 13.3    | 18.5   | 16.18   | "                        | 18        |

The packaging of those components of the 10-in-1 Ration that was not covered by already existing specifications was described in the new specification. Army Spread, canned bacon, soluble coffee product, and jams were to be packaged in round, hermetically sealed, open-top-style metal cans. Hot-dipped tin plate was prescribed for the bacon and jams, 1.25 pound for the former and 1.50 pound for the latter. For the Army Spread either 1.25 pound hot-dipped or 0.5 pound electrolytic tin plate might be used. For the soluble coffee product 0.5 pound electrolytic tin plate was prescribed although the ends might, if desired, be made of either enameled or lacquered black iron or bonderized black iron plate. The cans for Army Spread, bacon, and jams were required to be coated overall outside, except for the soldered side seams, with a rust-resistant lacquer or enamel, and those for Army Spread and jams were also required to be coated on the inside with a lacquer or enamel suitable for the product. Dehydrated baked beans were to be packaged either in a waxed-paper wrap or a wax-dipped, siftproof, seal-end carton with an inner lamination of greaseproof paper. Fruit bars might be packaged in cellophane bags and placed in tuck-end or seal-end cartons, or wrapped in waxed glassine and placed in a tray or carton, or placed directly in a hot waxed tray, which should then be wrapped and sealed with cellophane. In all cases the tray or carton containing the fruit bar must then be pasteurized, and after cooling, overwrapped in cellophane. Each piece of hard candy was to be wrapped in waxed paper or cellophane "of such nature as to prevent undue adherence of the paper to the candy" and then, in units of one or two ounces, "overwrapped with a heat-sealing, water-vapor-resistant cellophane or similar water-vapor-resistant material." Orange and lemon powders were to be placed in aluminum foil envelopes. Sugar was to be packaged in a seal-end carton with tear slots; if necessary in order to render the package siftproof, it was to be overwrapped in a single thickness of paper. Salt must be packaged in a specially constructed kraft paper envelope "equipped with a perforated paper tape under the flap, which will expose the perforations when the flap is opened and allow the salt to be shaken out."

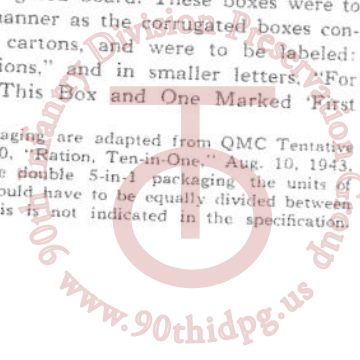
<sup>10</sup> The values for the ration are adapted from a chart entitled "Values for 10-in-1 According to Ralston Analysis As Compiled by Chicago QM Laboratory." The chart is undated, but other evidence in the files indicates that it was compiled at about this time. The analyses made by the Ralston Laboratory at this time were concerned only with components of the ration that had not previously been analyzed by it: two brands of cereal, jam, dehydrated corned beef hash, pork sausage, and lima beans (Capt. W. A. MacLinn to A. W. Gass, Aug. 13, 1943). For the other components the Subsistence Research Laboratory seems to have made use of analyses of these components previously made by the Ralston Laboratory in connection with other rations in which they were used. As in previous chapters, the recommendations of the Food and Nutrition Board of the National Research Council are taken from a table in a reprint of an article by Col. P. E. Howe, *Annals of American Academy of Political and Social Science*, Jan. 1943, p. 78.

After the envelope was filled, the flap was to be securely sealed so that the envelope would not allow its contents to sift. An alternative method of packaging salt was in a special or convolute-wound news-board or solid fiberboard container, near the top of which a perforated cap, which would allow the salt to be shaken out, was to be inserted and held in place prior to use by a removable inverted paperboard friction plug, placed in such a manner as effectively to prevent any sifting of the contents. The partial K Ration units for each menu, i.e., those not contained in cans, were to be assembled and sealed in a flat or envelope-style bag of laminated cellophane, and the bag placed in a folding seal-end or tuck-end chipboard carton. Halazone tablets were to be packaged in amber glass bottles, fifty tablets to a bottle. Soap was to be wrapped in a strong, water-resistant wrapper secured by a moisture-resistant adhesive. Toilet paper was to be packaged in an asphalt-laminated kraft paper envelope, and paper towels were to be inserted without any wrapping into one of the two large cartons composing each 5-in-1 unit. The surfaces of all packages, except the cans and transparent overwraps, were to have a dull, nonreflecting color "such as drab, khaki, olive, or that of unbleached kraft." All component packages were to be labeled with the name of the product, net weight, instructions for preparation, if necessary, and the name and address of the manufacturer.

The above description of the packaging of various components, while not exhaustive, illustrates the kind of packaging used for the different types of items and also indicates the care taken to insure that the packaging of each component was adequate.<sup>11</sup>

The components of the ration other than the items in cans and soap and towels were to be packed in two wax-dipped solid fiber cartons with snug fitting, corrugated, inner liners and top and bottom pads.<sup>12</sup> A menu for breakfast, dinner, and supper, indicating the components packed, was to be placed in both the top and bottom of each of these cartons. These cartons in turn were to be placed in corrugated boxes, which should be securely closed by a water-resistant adhesive or by gummed kraft paper tape. These boxes were to be labeled with 1-inch letters on two panels: "First Half of 5 Rations," and in smaller letters, "For 5 Complete Rations Use This Box and One Marked 'Second Half of 5 Rations.'" The canned items, soap, and towels were to be packed in two weatherproof solid fiber boxes, the cans being separated from each other by corrugated board. These boxes were to be closed in the same manner as the corrugated boxes containing the wax-dipped cartons, and were to be labeled: "Second Half of 5 Rations," and in smaller letters, "For Complete Rations Use This Box and One Marked 'First

<sup>11</sup> The descriptions of packaging are adapted from QMC Tentative Specifications, C.Q.D. No. 140, "Ration, Ten-in-One," Aug. 10, 1943.  
<sup>12</sup> In order to provide the double 5-in-1 packaging the units of each component, of course, would have to be equally divided between the two cartons, although this is not indicated in the specification.



Depot with the prime contractors to discuss labor saving and conservation matters led to the recommendation that similar meetings should be held from time to time in the future as a means of developing better production and conservation methods.<sup>84</sup> An interesting fact reported concerning the assembly of the 10-in-1 Ration at the Wrigley plant was that a group bonus system instituted by that company had practically doubled production.<sup>85</sup>

#### TESTING THE RATION

Although it had been decided that, because of the similarity of components of the 10-in-1 to those of other rations previously tested, extensive tests prior to large-scale procurement would not be necessary, it was not intended to dispense entirely with tests of the new ration. In mid-September an organoleptic test of the 10-in-1 Ration was conducted by the Food Testing Committee in the Office of The Quartermaster General. Detailed reactions of the Committee to each menu were reported. The combinations of products into meals were considered satisfactory in all except Menus III and V. In the case of the former the substitution of another meat for the K Ration pork component was recommended. In the case of the latter it was suggested that the egg product in the dinner menu should be changed because of the presence of an egg product in the breakfast menu. It was also suggested that a vegetable other than lima beans be used in the supper menu. The addition of sugar to the breakfast and supper meals of Menus I and II, in both of which coffee was the beverage for both meals, was recommended. In Menu II the string beans used were said to be too tough and lacking in flavor, and the desirability of disguising the kidney flavor in the stew by the addition of a little more seasoning was mentioned.<sup>86</sup>

Early in October a test of the 10-in-1 Ration was conducted at the Desert Training Center in California, the purpose of which was described officially as follows.

The purpose of this test is to determine whether any changes are necessary in the normal method of handling rations at Base Depots, in transport, at railheads, within units and also to determine if the packing is satisfactory. It is desired that no particular instructions be issued regarding this test and that the flow of rations from the base Depot continue as if there were no change in type. The points to be studied are:

- a. amount of labor and trouble involved at the railhead in comparison with the standard field ration.
- b. system employed in making distribution of this ration at the railhead.
- c. the means used to allocate the several menus.
- d. the method used in the regiment to assure an even distribution of the ration whether to community messes or to small detached groups and individual vehicles.
- e. any defects in packing.<sup>87</sup>

For the test 50 thousand 10-in-1 Rations were shipped to the Mira Loma Quartermaster Depot.<sup>88</sup> First Lieutenant Clinton Morrison and Albert W. Gass attended as observers

<sup>84</sup> C. J. Morgan, Travel Report No. 158 as reported in OQMG, "Daily Activity Report," Nov. 25, 1943 (Vol. XXIX, No. 18).

<sup>85</sup> H. E. Jahn, Travel Report No. 41 as reported in OQMG, "Daily Activity Report," Nov. 5, 1943 (Vol. XXIX, No. 5).

<sup>86</sup> "Test of 10-in-1 Ration," n.d. (c. Sept. 18, 1943). The members of the Food Testing Committee at this time were as follows: Col. Paul P. Logan, Chairman, Col. L. C. Webster, Lt. Col. Henry B. Walker, Lt. Col. C. F. Kearny, Lt. Col. A. J. Youndt, Lt. Col. Cecil G. Dunn, Major Logan Morrill, Dr. Bernard E. Proctor, Miss Mary I. Barber, Miss Marian E. Gray (OQMG Office Order No. 30-9D, Sept. 22, 1943).

<sup>87</sup> Hdqrs., AGF, by command of Lt. Gen. McNair to Commanding General, Desert Training Center, Camp Young, Calif., Sept. 25, 1943. The copy of this memo in the files is unsigned.

<sup>88</sup> *Ibid.*

from the Office of The Quartermaster General. The test was conducted in two sections of 5 days each during the period September 30 to October 10, "different groups subsisting on the ration during each period." The groups subsisting on the ration pursued their customary activities. One group had just returned from maneuvers and was overhauling its equipment. The other group, with the exception of one unit which was carrying out platoon leadership problems about 40 miles from camp, was leading a normal garrison life.<sup>89</sup>

As most of the test units were in camp, and not engaged in maneuvers, the rations were prepared in several ways. Some units combined the total number of rations issued them and prepared and served them in the same manner as a garrison mess. Others formed a mess line and gave every 10th man a box of the rations and allowed them to mess in groups of 10. Either method was satisfactory but the unit mess was slightly more preferable because when the men were given the day's ration at one time there was a tendency to pick the most desirable items for the first meal without regard to menu.<sup>91</sup>

From the point of view of ease of distribution the new ration proved to be a tremendous success. "As was contemplated at the time the ration was designed, it proved much less complicated to ship, break down and issue to units than the 'B' Ration."<sup>92</sup> "Comparative tests on a regimental basis showed that the breakdown and distribution of the 10-in-1 required only 1/3 as much time as for the B field ration."<sup>93</sup> Moreover, whereas transportation of the B Ration for a regiment required five 2½ ton trucks, two such trucks sufficed to transport the necessary number of 10-in-1 Rations;<sup>94</sup> thus a valuable saving in space as well as time was achieved by the use of the latter. "Another advantage of this ration is the elimination of the unsanitary conditions found around distributing points for Class 1 supplies caused by spilling or breaking cartons or foodstuffs during the ration breakdown."<sup>95</sup> The only serious difficulty encountered in distribution was that of identifying and separating the five different menus because of the small size of the stenciled number on the box.

No adverse comments concerning the packaging were made, but a difficulty in requisitioning due to the multiple packing of the ration was noted.

Because it is packaged so that 5 rations (2 cartons) is the smallest unit into which the ration is divided, a requisition based upon the exact number of men present for rations may lead to difficulties. The larger the unit making the requisition the greater is the problem presented. The best solution seems to be that of having each unit, beginning with the smallest unit operating a mess, submit to the next higher unit the number of rations required based on the 5 ration package. Thus a light tank platoon sending 3 tanks (4 men crews) out on separate 24 hour missions would have to provide each tank with a package of 5 rations. Fifteen rations would be required for 12 men.<sup>96</sup>

<sup>89</sup> 1st Lt. Clinton Morrison and A. W. Gass, "Report on Inspection of Quartermaster Activities at [Desert Training Center] Sept. 24—Oct. 11, 1943," Oct. 15, 1943; Col. R. D. Palmer, Pres., Desert Warfare Board, to Commanding General, AGF, Oct. 15, 1943, "Desert Warfare Board Observations on Test of 10-in-1 Rations Conducted by the Quartermaster Corps in the Desert Training Center." The former report will hereafter be cited "Report" and the latter "Desert Warfare Board, Observations."

<sup>90</sup> Morrison and Gass, "Report."

<sup>91</sup> Desert Warfare Board, "Observations."

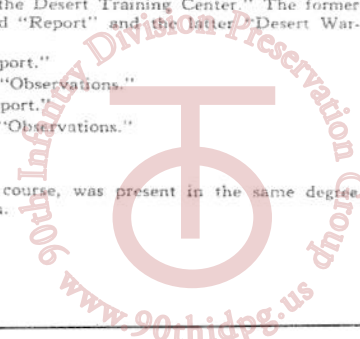
<sup>92</sup> Morrison and Gass, "Report."

<sup>93</sup> Desert Warfare Board, "Observations."

<sup>94</sup> *Ibid.*

<sup>95</sup> *Ibid.*

<sup>96</sup> *Ibid.* This difficulty, of course, was present in the same degree with the former 5-in-1 Ration.



them during combat. Canned heat, similar to Sterno, was also satisfactory for heating purposes, but there was considerable loss through evaporation. "Much of the product had evaporated and cans were only half full." Moreover, at least three 4-ounce cans were required to prepare two meals. A British unit, consisting of heat tablets and a folding grill, which could easily be carried in the pocket when folded, was also used with success. "The heat tablets were too large to carry in the pocket but could be reduced in size."

On the whole, the 10-in-1 Ration was revealed by this test to be a very satisfactory ration for the purpose for which it was intended.

The ration was very well accepted by the men and, with a few minor changes, will be an excellent ration. It is well packaged, will stand rough handling, is easily prepared by the individual soldier and lends itself to many operations where the Field Ration B could not be handled.<sup>17</sup>

As a result of the data gathered from the test it was recommended that

- a. The calorific value of the 10-in-1 be increased by replacing low caloric foods with foods of high calorific value.
- b. The dehydrated baked beans be replaced with a more acceptable product.
- c. The instant cocoa and coffee replace the fruit juice powders for the evening meal.
- d. The coffee be eliminated from the noon meal and fruit powders only be used.
- e. The soap in one menu be replaced with Brillo and a steel wool wad.
- f. At least two more towels per ration be added.
- g. An individual heat unit be added to the ration or issued to the soldier independent of the ration.<sup>18</sup>

At the close of the year 1943 the testing of the 10-in-1 Ration under conditions of extreme cold at the Climatic Research Laboratory at Lawrence, Massachusetts, was being undertaken.<sup>19</sup> Other plans for the testing of the ration and its components under controlled accelerated storage were also being made.<sup>20</sup>

#### RECENT CHANGES IN THE RATION

As a result of these tests, particularly the earlier ones,<sup>21</sup> and other factors several changes in the composition and arrangement of the ration were made in the fall of 1943. At a conference late in October it was decided to handle the complaint of lack of sugar for coffee by adding four 6-ounce or 8-ounce packages of sugar to Menu II and two similar packages to each of the other menus, the number of packages in each case to be equally divided between the 5-in-1 units.<sup>22</sup> Whether a 6-ounce or 8-ounce package was to be used

<sup>17</sup> Col. R. A. Isker to The QMG, Nov. 30, 1943, "Report on Tests of 10-in-1 Ration in the United Kingdom."

<sup>18</sup> Same to same of identical date, "Report on Tour of United Kingdom."

<sup>19</sup> Same to same, "Report on Test of 10-in-1 Ration in the United Kingdom."

<sup>20</sup> Research and Development Branch, Military Planning Div., (Proctor) to Subsistence Branch, Storage and Distribution Div., Dec. 31, 1943.

<sup>21</sup> Same to same, Jan. 1, 1944.

<sup>22</sup> Scarcely enough time had elapsed by the end of the year for changes based on the recommendations emanating from the test in England to be effected.

<sup>23</sup> Major V. O. Wodicka to Canned Meats and Special Rations Section, Central Subsistence Branch, Procurement Div. [CQD], Oct. 27, 1943. Since Menu I like Menu II provided coffee for two meals, four packages should logically have been added to the former as well as to the latter; room, however, was not available for another package in the 5-in-1 units of this menu, and logic was forced to yield to cold reality (Research and Development Branch [Gass] to Subsistence Branch, Oct. 27, 1943). As was subsequently pointed out, "the addition of sugar . . . also adds to the caloric value of this ration" (Col. G. F. Donot to Hdqrs., ASF, Nov. 29, 1943, 3rd ind. to memo Col. R. D.

was to depend upon the capacity of industry to produce the 6-ounce size.<sup>23</sup> To achieve variety in the biscuit component it was decided that as soon as a new type biscuit could be developed and approved,<sup>24</sup> it should be alternated by menus with the C Square biscuit then in use and that ultimately, if the capacity of industry to produce 1-pound boxes proved adequate, the 2-pound box in each menu should be replaced by two 1-pound boxes, each containing a different type biscuit.<sup>25</sup> The 2-ounce chocolate D-bar was to be replaced eventually by two 1-ounce bars of milk chocolate to be produced in accordance with a specification on which the Subsistence Research Laboratory was then working. If, however, the new milk chocolate could not be developed and produced in time,<sup>26</sup> the D-bar was to be replaced by a 2-ounce bar of all-weather chocolate recently developed and already in production.<sup>27</sup> To meet the criticism of repetition of certain components in consecutive menus it was decided to switch the K Ration cheese component and egg product component in the first and last menus. In regard to non-food components it was decided to double the number of paper towels and to double the number of cigarettes in those menus where space permitted, namely, the last three.<sup>28</sup>

Greater variety in the pre-mixed cereal was felt to be desirable. In October a sample of pre-mixed cereal submitted by the Quaker Oats Company, which had not previously manufactured any cereal for the 10-in-1 Ration, was tested by the Subsistence Research Laboratory and found to be satisfactory and a desirable addition to the cereals then being used.<sup>29</sup> In the following month it was announced that improved formulae for the cereals had been developed.<sup>30</sup> By the middle of December a schedule had been worked out according to which the cereals for the ration were to be produced by four companies according to several formulae and distributed among the various menus as follows:

Palmer, Pres., Desert Warfare Board, to Commanding General, AGF, Oct. 15, 1943).

<sup>24</sup> To the objection that 8 ounces of sugar would be more than necessary to sweeten five  $\frac{3}{4}$  filled canteen cups of coffee it was replied that "if the 8-ounce packages were used, the excess of sugar might conceivably be spread on the cereal, as there were a few comments in the desert that more sugar for some of the cereals might be included" (Capt. W. A. MacLinn to George Burgess, Oct. 28, 1943).

<sup>25</sup> Research on the development of new types of ration biscuits had been under way for some time (Research and Development Branch, Military Planning Div., "Status Report of Research and Development Projects at Depots and Camps," June 30, 1943, p. 28). At the end of the year it was announced: "A new type of fruit biscuit has been developed and is now being tested for stability" (*idem*, "Status Report of Research and Development Projects," Dec. 31, 1943, p. 40).

<sup>26</sup> Research and Development Branch (Gass) to Subsistence Branch, Oct. 27, 1943; Major V. O. Wodicka to Canned Meats and Special Rations Section, Central Subsistence Branch, Procurement Div. [CQD], Oct. 27, 1943.

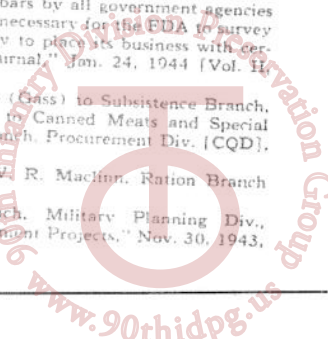
<sup>27</sup> At the end of the year it was reported that formulas of sweet chocolates were still being investigated (Research and Development Branch, Military Planning Div., "Status Report of Research and Development Projects," Dec. 31, 1943, p. 45). It was, however, subsequently announced: "Specifications for a sweet chocolate bar developed in the Laboratory were issued 15 January and procurement is getting underway on the bar, which will be included in Ten-in-One . . . The new bar has high nutritional and keeping qualities and is very palatable. . . . The bar tastes similar to a Hershey or Nestle bar" ("CQD Daily Activity Report, 1-15 January 1944").

<sup>28</sup> This bar proved to be very popular. Early in 1944 it was reported: "The demand for all-climate chocolate bars by all government agencies has become so great that it has become necessary for the FDA to survey the industry and to request each agency to place its business with certain manufacturers" ("OQMG War Journal," Jan. 24, 1944 [Vol. II, No. 16]).

<sup>29</sup> Research and Development Branch (Gass) to Subsistence Branch, Oct. 27, 1943; Major V. O. Wodicka to Canned Meats and Special Rations Section, Central Subsistence Branch, Procurement Div. [CQD], Oct. 27, 1943.

<sup>30</sup> 2nd Lt. R. R. Mickus to Capt. W. R. MacLinn, Ration Branch [CQD], Oct. 23, 1943.

<sup>31</sup> Research and Development Branch, Military Planning Div., "Status Report of Research and Development Projects," Nov. 30, 1943, p. 40.



The liners were tried on every third case going down the line and, after a few difficulties were ironed out, there was no trouble in inserting the liner in the arsenal box nor in the filling or closing operation.<sup>27</sup>

In October this change was made applicable to all packers.<sup>28</sup> At the October conference referred to previously<sup>29</sup> it was decided that, in accordance with a recommendation made as the result of the test at the Desert Training Center,<sup>30</sup> the menu number, in addition to appearing on the sleeve, as originally prescribed, should also be placed on the front of the case under the packing information contained thereon and should be in 3-inch instead of 1½-inch letters. The menu numbers were also ordered to be placed in 1-inch letters on one side of each of the four inner cartons, which had not previously contained this information.<sup>31</sup> It was reported that the Chicago Depot, in furtherance of the conservation of packing materials, which by this time were becoming very critical, was planning to ask all suppliers of components of the ration to tape or spot-glue instead of stitching or over-all-gluing the containers in which they shipped their product

<sup>27</sup> Lt. R. de S. Couch to Col. R. A. Isker, Sept. 18, 1943.

<sup>28</sup> Major V. O. Wodicka to O. C. Canned Meats and Special Rations Section, Central Subsistence Branch, Procurement Div. [CQD], Oct. 27, 1943. This change in specifications for packaging was formally approved in a 1st ind. to the above, Brig. Gen. C. A. Hardigg to Commanding General, CQD, Nov. 1, 1943.

<sup>29</sup> *Supra*, p. 118.

<sup>30</sup> Cf. *supra*, p. 117.

<sup>31</sup> *Ibid.* In giving his formal approval to these changes General Hardigg further emphasized their importance by stating: "It is desired that the menu [number] be placed as prominently as possible on both the inner and outer cartons."

to assembly points in order that the containers might be reused several times.<sup>32</sup> In line with the trend toward camouflaging all items for use in theaters of operations it was ordered in mid-November that all cans used in the 10-in-1 Ration should in the future be coated with an olive drab paint in place of the gold enamel that had previously been used on the most of them.<sup>33</sup>

The story of the 10-in-1 Ration has here been carried down to the end of the year 1943. Though still in its infancy in comparison with the other special rations then in use, it had already proved itself to be eminently satisfactory and had successfully taken its place as the small-group field ration envisaged in the spring of 1943,<sup>34</sup> which, together with the individual combat ration suggested at the same time, it was hoped would take the place of all other rations except Types A and B. As we have seen in a previous chapter, the attempt to develop the proposed individual combat ration had not met with the success achieved by the 10-in-1 as a small-group ration. At the end of 1943 efforts to perfect the former ration were still continuing but nothing entirely satisfactory had been evolved, and it seemed likely, therefore, that the special rations Types C, D, and K would continue to be used as individual combat rations, with the 10-in-1 as the small-group ration, throughout the remainder of the war.

<sup>32</sup> H. E. Jahn, Travel Report No. 130, as reported in OQMG, "Daily Activity Report," Nov. 23, 1943 (Vol. XXIX, No. 16).

<sup>33</sup> Col. L. C. Webster to Commanding General, CQD, Nov. 15, 1943; see also Capt. G. H. Muth to H. J. Heinz Co., Oct. 11, 1943, and Research and Development Branch (Doriot) to Subsistence Branch, Nov. 12, 1943.

<sup>34</sup> *Supra*, p. 108.